UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the NOVEMBER 2004 question paper

0652 PHYSICAL SCIENCE

0652/02 **Paper 2 , maximum raw mark 80**

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

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Grade thresholds taken for Syllabus 0652 (Physical Science) in the November 2004 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 2	80	n/a	47	34	25

The threshold (minimum mark) for B is set halfway between those for Grades A and C.
The threshold (minimum mark) for D is set halfway between those for Grades C and E.
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.
Grade A* does not exist at the level of an individual component.

November 2004

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0652/02

PHYSICAL SCIENCE
Paper 2

UNIVERSITY of CAMBRIDGE
International Examinations

1 (a)(i) Moment = 5 ×8 **[1]**
= 40 Ncm **[2]**
(-1 for incorrect/no unit)

(ii) 40 Ncm (ecf) **[1]**

(iii) 80 Ncm (ecf) **[1]**

(b)(i) Increases the moment **[1]**

(ii) Decreases the moment **[1]**

(c) (Electric) motor/ammeter etc. NOT generator/dynamo etc. **[1]**

Total [8]

2 (a) Brownian (motion) **[1]**

(b) molecules **[1]**
collide **[1]**
larger **[1]**
molecules **[1]**

Total [5]

3 (a)(i) Convection **[1]**

(ii) Water expands on heating
Becomes less dense } ANY TWO **[2]**
Rises

(b)(i) Conduction **[1]**

(ii) Chemical **[1]**
Heat/Thermal Internal **[1]**
Exothermic (accept irreversible) **[1]**

(c) Insulating/lagging the tank – DO NOT accept vacuum or paint silver **[1]**

Total [8]

4 (a) Z **[1]**
because this contains P and Q from X and R from Y **[1]**

(b) R **[1]**
because this has travelled furthest with the (moving) solvent or equivalent idea **[1]**

Total [4]

5 (i) Graphite
- √ 3 (covalent) bonds for each atom
- √ two dimensional structure
- √ layers
- √ strong bonds in layer and weak bonds between layers

ANY TWO **[2]**

(ii) Diamond
- √ 4 (covalent) bonds for each atom
- √ three dimensional structure
- √ tetrahedral
- √ all strong bonds

ANY TWO **[2]**

For both: NOT properties, NOT uses **Total [4]**

6 (a)(i) Loss of one (outer) electron **[1]**

(ii) Gain of one (outer) electron **[1]**

(b) Transfer of (one) electron from K to I **[1]**
To form ions that attract each other (K^+ and I^-) **[1]**

Can be answered mainly by diagram **Total [4]**

7 (a)(i) 0.75 A **[1]**

(ii) Use of R = V/ I **[1]**
R = 6 **[1]**
ohm **[1]**

(iii) 3 (ohm) (ecf) **[1]**

(b) 3.0 A **[1]**

(c) Fig 7.2 **[1]**
larger current through each bulb (necf) **[1]**

Total [8]

8 (a)(i) CH_4 **[1]**

(ii) (12 + 4) 16 (ignore any unit) **[1]**

(b) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$)
(error carried forward) all correct formulae **[1]**
correct balancing **[1]**

Total [4]

9 (a) Oxygen is removed **[1]**
from the copper oxide **[1]**
(or in terms of electron exchange)

(b) √ high density
√ coloured compounds
√ high melting point
√ can be used as a catalyst (element or in compound)
ANY TWO **[2]**

Total [4]

10 (a) Filter (to remove excess magnesium) **[1]**
leave filtrate to crystallise or equivalent **[1]**

(b) Use lighted splint NOT 'glowing' splint **[1]**
"pops" (necf) **[1]**

Total [4]

11 (a)(i) One ray correctly deflected towards the normal **[1]**
Second ray correct and consistent (not parallel to first not converging) **[1]**

(ii) Normal drawn and *i* correctly marked **[1]**

(iii) Refraction **[1]**

(b) Some explanation that the writing will be seen in a mirror **[1]**
Use of the term lateral inversion **[1]**

Total [6]

12 (a)(i) Iodine **[1]**

(ii) Bromine is more reactive than iodine or equivalent **[1]**

(b) Bromine is less reactive than chlorine or equivalent **[1]**

Total [3]

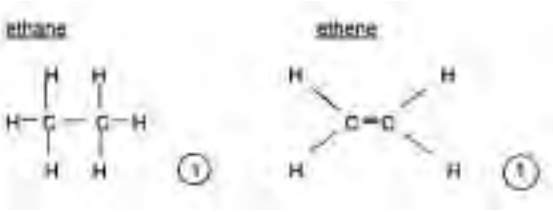
13 Step 1 Filtration **[1]**
to remove mud etc. **+[1]**

Step 2 Chlorination (do not accept boiling) **[1]**
to kill bacteria etc. **+ [1]**

(*If in wrong order, mark as though in correct order but ignore the first mark scored)*

Total [4]

14 (a) **[2]**



(b) Alkenes have a double (carbon) bond **[1]**
but alkanes have only single bonds (accept but alkanes do not), **[1]**

(Must have the double statement for both marks)

Total [4]

15 (a)(i) Nuclides with same number of protons **[1]**
but different number of neutrons **+ [1]**

(ii) Electron **[1]**
very fast moving/emitted in radioactive decay **+ [1]**

(b)(i) 38 **[1]**
52 **[1]**
38 **[1]**

(ii) Electron **[1]**

(c) 39 **[1]**
0 **[1]**

Total [10]